

Name 1: \_\_\_\_\_

Name 2: \_\_\_\_\_

Period: \_\_\_\_\_ Table: \_\_\_\_\_

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## Part 1 - Hydrogen Atom

1. Open <http://phet.colorado.edu/en/simulation/hydrogen-atom>

2. In program click:

- "Prediction"
- "Bohr"
- "Show Spectrometer"
- "Show electron energy level diagram"
- "Slow"

3. The screen should look like Figure 1 once done.

4. Click EM gun to start the flow of energy packets (photons).

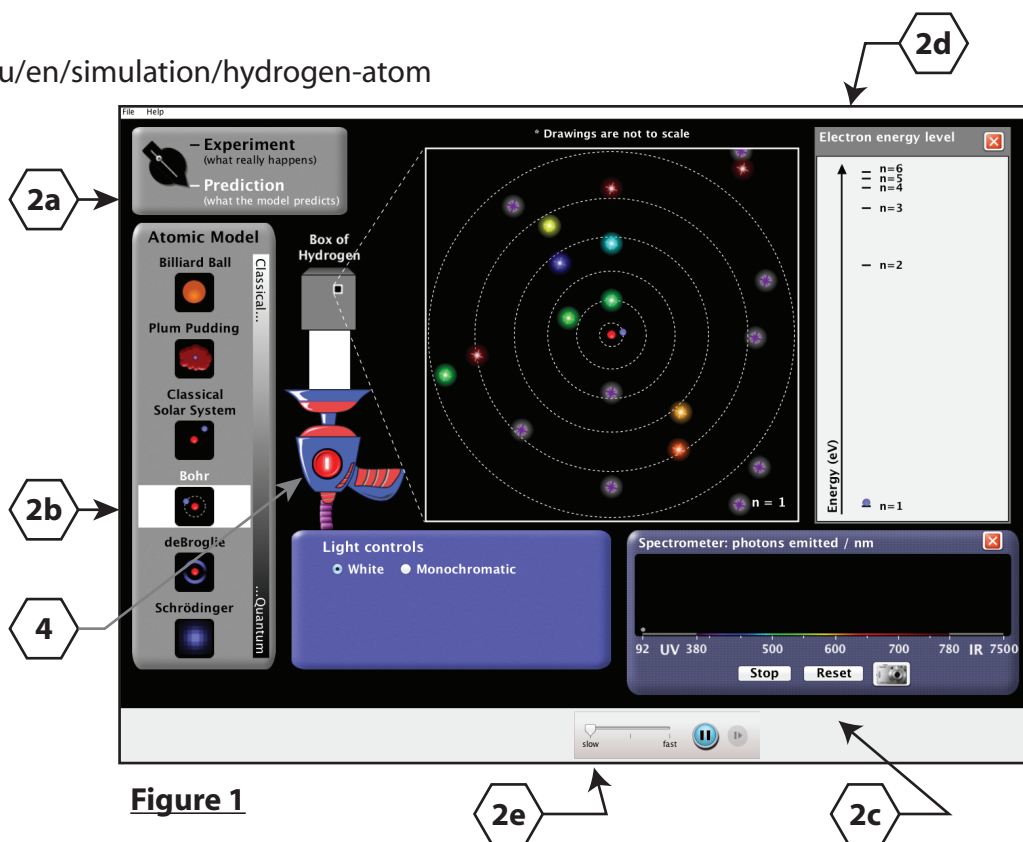
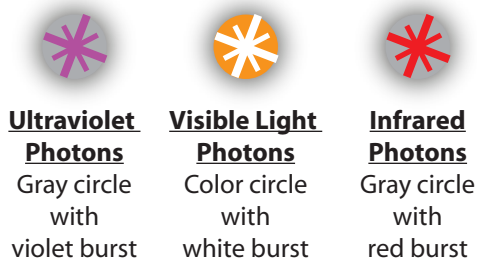


Figure 1

5. Observe when energy packets hit the Hydrogen Atom.

### 6. Answer Questions IN COMPLETE SENTENCES

a) Do any of the **Visible Light** photons cause the electron to get excited (jump to a higher energy level)? [2]

Deep Red	Red	Orange	Yellow	Green	Teal	Blue	Violet
Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N

<< Circle

b) Do any of the **Ultraviolet** photons cause the electron to get excited (jump to a higher energy level)? [2]

c) When the electron gets excited, does it always jump up to the same energy level (n)? Explain. [2]  
(Use the Electron Energy Level chart)

**You may want to move the speed to Medium to answer the next few questions**

d) When the electrons jump to lower energy levels, do they always jump back to the ground energy level ( $n=1$ )? Explain. (Observe the Electron Energy Level chart) [2]

e) When the electrons jump to lower energy levels, do they always release the same type of photon? Explain. (Use the Spectrometer to keep track of what type is released) [2]

f) What type of photon is released when electron jumps down ... [10 points]  
(Use the Spectrometer and Electron Energy Level chart to keep track of what type is released)

**Write photon color if applicable.**

**Count each time a photon is released (Record a minimum of 30 counts)**

**You may want to return to "Slow" Mode and Reset after each time the electron reaches  $n=1$ .**

from $n=$	to $n=$	photon type	count (use ticks)
6	5		
6	4		
6	3		
6	2		
6	1		
5	4		
5	3		
5	2		
5	1		
4	3		
4	2		
4	1		
3	2		
3	1		
2	1		